

DISC STORAGE SYSTEM WITH ADAPTIVE PID CONTROL

ABSTRACT OF THE DISCLOSURE

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A disc drive controller circuit for an actuator receives reference data indicating a desired actuator position " θ_d ", error data indicating a difference "e" between the desired actuator position and a sensed actuator position " θ ", and adaptive parameter data " \hat{A} ". The controller circuit calculates a circuit output "u" that drives the actuator. The controller circuit derives the circuit output "u" according to a formula:

$$\hat{A} \left(\ddot{\theta}_d + 2\lambda \dot{e} + \lambda^2 e \right) + k \left(\dot{e} + 2\lambda e + \lambda^2 \int_0^t e d\tau \right)$$

in which " λ " is a controller zero value and "k" is a controller gain value and "t" is time. The adaptive parameter \hat{A} is updated in general accordance with the formula:

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$$\hat{A}(k) = e_1 e_2 \Delta t + \hat{A}(k-1).$$